

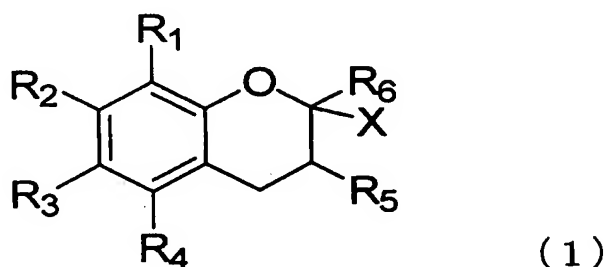
AMENDMENTS TO THE CLAIMS:

The following listing of claims replaces all prior listings, and all prior versions, of claims in the application.

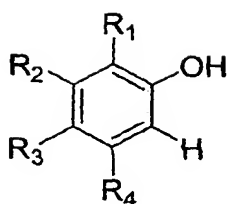
LISTING OF CLAIMS:

[1]. (Currently amended) A process for producing a chroman compound represented by formula (1):

[F1]



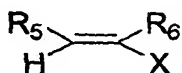
(wherein each of substituents R₁ to R₄, R₅ to R₆ and X represents a hydrogen atom, a halogen atom, a hydroxyl group, a methoxy group, an ethoxy group, a carboxyl group, a C1 to C12 alkyl group which may have a substituent, a C6 to C12 aryl group which may have a substituent, a C7 to C12 aralkyl group which may have a substituent, or an ester residue; R₁ to R₄ may be linked to one another; each of R₅ to R₆ represents a hydrogen atom or a C1 to C12 alkyl group, and X represents a hydrogen atom, a carboxyl group, an amide group, a nitrile group, an aldehyde group, an ester group and a C1 to C12 alkyl group which may have a substituent, the substituent represents a halogen atom, a hydroxyl group, a carboxyl group or an ester group, characterized in that the process comprises allowing a phenol represented by formula (2):



(2)

(wherein each of R₁ to R₄ represents as same as those of formula (1)),

an unsaturated compound represented by formula (3):



(3)

(wherein R₅, R₆ and X represent as same as those of formula (1)) and at least one of the substituents X and R₆ is an ester residue), characterized in that the process comprises allowing a phenol, an olefin, and a formaldehyde to react in the absence of catalyst and in the presence of water in an amount by mole 1 to 10 times that of the phenol.

[2] (Currently amended) A process for producing a chroman compound as described in claim 1, wherein the phenol is an alkylphenol or a polyhydroxybenzene, and the unsaturated compound is at least one member selected from the group consisting of C₃ to C₂₄ aliphatic compound~~olefin is a methacrylate ester.~~

[3] (Currently amended) A process for producing a chroman compound as described in claim 2, wherein the phenol is at least one member selected from the group consisting of 2-methylphenol, 3-methylphenol, 4-methylphenol, 2,3-dimethylphenol, 2,4-dimethylphenol, 2,5-dimethylphenol, 3,4-dimethylphenol, 3,5-

dimethylphenol, 2,3,4-trimethylphenol, 2,3,5-trimethylphenol, 2,4,5-trimethylphenol, 3,4,5-trimethylphenol, 2,3,4,5-tetramethylphenol, hydroquinone, 1,4-dihydroxy-2-methylbenzene, 1,4-dihydroxy-2,3-dimethylbenzene, 1,4-dihydroxy-2,5-dimethylbenzene, 1,4-dihydroxy-2,6-dimethylbenzene, and 1,4-dihydroxy-2,3,5-trimethylbenzene, and the unsaturated compound ~~olefin~~ is at least one member selected from the group consisting of acrylic acid, methyl acrylate, ethyl acrylate, acrylonitrile, acrylamide, acrolein, methacrylic acid, methyl methacrylate, ethyl methacrylate, isopropyl methacrylate, n-butyl methacrylate, isobutyl methacrylate, 2-hydroxyethyl methacrylate, 2-methylacrylonitrile, 2-methylacrylamide, methacrolein, crotonic acid, methyl crotonate, ethyl crotonate, crotononitrile, crotonamide, crotonaldehyde, crotonalcohol, 2-methylcrotonic acid, methyl 2-methylcrotonate, ethyl 2-methylcrotonate, 2-methylcrotononitrile, 2-methylcrotonamide, 2-methylcrotonaldehyde, 2-methylcrotonalcohol, 3-methylcrotonic acid, methyl 3-methylcrotonate, ethyl 3-methylcrotonate, 3-methylcrotononitrile, 3-methylcrotonamide, 3-methylcrotonaldehyde, 3-methylcrotonalcohol, 4-methyl-pent-4-enoic acid, 4-methyl-pent-4-enoic acid methyl ester, 4-methyl-pent-4-enoic acid ethyl ester, 4-methyl-pent-4-enal, 4-methyl-pent-4-en-1-ol, 3-methyl-but-3-en-1-ol, and 2-methyl-prop-2-en-1-ol ~~methyl methacrylate, ethyl methacrylate, isopropyl methacrylate, n-butyl methacrylate, isobutyl methacrylate, and 2-hydroxyethyl methacrylate.~~

[4] (Cancelled).

[5] (Currently amended) A process for producing a chromancarboxylic acid ester as described in claim 12[[4]], wherein the phenol is an alkylphenol or a polyhydroxybenzene, and the olefin is a methacrylate ester.

[6] (Currently amended) A process for producing a chromancarboxylic acid ester as described in claim 5, wherein the phenol is at least one member selected from the group consisting of 2-methylphenol, 3-methylphenol, 4-methylphenol, 2,3-dimethylphenol, 2,4-dimethylphenol, 2,5-dimethylphenol, 3,4-dimethylphenol, 3,5-dimethylphenol, 2,3,4-trimethylphenol, 2,3,5-trimethylphenol, 2,4,5-trimethylphenol, 3,4,5-trimethylphenol, 2,3,4,5-tetramethylphenol, hydroquinone, 1,4-dihydroxy-2-methylbenzene, 1,4-dihydroxy-2,3-dimethylbenzene, 1,4-dihydroxy-2,5-dimethylbenzene, 1,4-dihydroxy-2,6-dimethylbenzene, and 1,4-dihydroxy-2,3,5-trimethylbenzene, and the methacrylate esterolefin is at least one member selected from the group consisting of methyl methacrylate, ethyl methacrylate, isopropyl methacrylate, n-butyl methacrylate, isobutyl methacrylate, and 2-hydroxyethyl methacrylate.

[7] (Currently amended) A process for producing a chromancarboxylic acid ester as described in claim 12[[4]], wherein the methacrylate esterolefin and the formaldehyde are used in amounts in stoichiometrically excess of the amount of the phenol.

[8] (Currently amended) A process for producing a chromancarboxylic acid ester as described in claim 12[[4]], wherein the formaldehyde is at least one member selected from the group consisting of formaldehyde and paraformaldehyde.

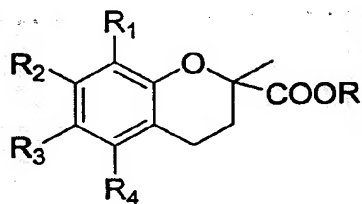
[9] (Currently amended) A process for producing methyl 6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylate, characterized in that the process comprises allowing 1,4-dihydroxy-2,3,5-trimethylbenzene~~1,4-dihydroxy-2,6-dimethylbenzene~~, methyl methacrylate, and a formaldehyde to react in the absence of catalyst and in the presence of water in an amount by mole 1 to 10 times that of 1,4-dihydroxy-2,3,5-trimethylbenzene~~1,4-dihydroxy-2,6-dimethylbenzene~~.

[10] (Currently amended) A process for producing a chromancarboxylic acid, characterized by comprising hydrolyzing a chromancarboxylic acid ester produced through a process as recited in claim 12[[4]].

[11] (Previously presented) A process for producing a chromancarboxylic acid, characterized by comprising hydrolyzing methyl 6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylate produced through a process as recited in claim 9.

12. (New) A process for producing a chromancarboxylic acid ester represented by formula (4):

[F4]

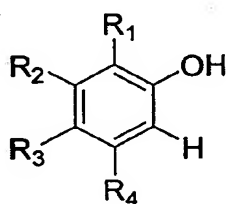


(4)

(wherein each of R₁ to R₄ represents a hydrogen atom, a halogen atom, a hydroxyl group, a methoxy group, an ethoxy group, a carboxyl group, or a C1 to C12_{alkyl}

group which may have a substituent, a C6 to C12 aryl group which may have a substituent, a C7 to C12 aralkyl group which may have a substituent; R₁ to R₄ may be linked to one another; R represents a C1 to C12 alkyl group which may have a substituent, the substituent represents a halogen atom, a hydroxyl group, a carboxyl group or an ester group), characterized in that the process comprises allowing a phenol represented by formula (2):

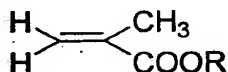
[F5]



(2)

(wherein each of substituents R₁ to R₄ represents as same as those of formula (4)),
a methacrylate ester represented by formula (5):

[F6]



(5)

(wherein R represents as same as that of formula (4))

and a formaldehyde to react in the absence of catalyst and in the presence of water
in an amount by mole 1 to 10 times that of the phenol.